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IN THE CLAIMS:

Please amend the claims as follows:

1. (currently amended) A method for optimizing an LC/MS apparatus ~~system~~ comprising an API interface into which a matrix is to be flowed according to a composition gradient profile, the method comprising:

(a) determining a temperature profile according to which a gas is to be flowed into the API interface ~~for vaporizing the matrix~~, the matrix comprising at least a first solvent having a first composition and a second solvent having a second composition different from the first composition, wherein the temperature profile varies the temperature of the gas as the composition of the matrix ~~mobile phase~~ varies along the gradient profile for optimizing vaporization of the matrix ~~mobile phase~~, and determining the temperature profile comprises determining a first temperature of the gas for adding heat to the first solvent to evaporate the first solvent and a second temperature of the gas for adding heat to the second solvent to evaporate the second solvent;

(b) determining a flow profile according to which the gas is to be flowed into the API interface;

(c) programming an electronic processor-based device to control the flow of the gas into the API interface according to the temperature profile and the flow profile; and

(d) flowing the gas into the API interface for interacting with the matrix.

2. (currently amended) The method according to claim 1, wherein ~~the matrix comprises at least two solvents, and determining the temperature profile comprises determining, based on the gradient profile and a flow rate of the matrix into the API interface, a first temperature of the gas for adding heat to~~ the first solvent is the least volatile of the solvents flowing into the API interface, and ~~a second temperature of the gas for adding heat to~~ the second solvent is the most volatile of the solvents flowing into the API interface.

3. (original) The method according to claim 1, wherein determining the temperature profile comprises determining a gradient delay time for the LC/MS system.

4. (original) The method according to claim 3, wherein determining the gradient delay time comprises measuring a period of time required for a gradient composition change in the matrix to reach the API interface.

5. (original) The method according to claim 3, wherein the temperature profile comprises a portion corresponding to the gradient delay time, and the portion has a substantially constant temperature value.

6. – 7. (canceled)

8. (original) The method according to claim 6, wherein determining the flow profile comprises determining a first elution time at which a first analyte is to be eluted from an LC column into the API interface.

9. (original) The method according to claim 8, wherein determining the flow profile comprises determining a second elution time at which a last analyte is to be eluted from the column into the API interface, wherein at least a portion of the flow profile generally corresponds to a period from the first elution time to the second elution time.

10. (original) The method according to claim 9, comprising determining an initial elution period during which the mobile phase is flowed through the column generally up to the first elution time, and determining another portion of the flow profile based on the initial elution period.

11. (original) The method according to claim 10, wherein the portion of the flow profile corresponding to the initial flow period has a higher flow value than the portion of the flow profile from the first elution time to the second elution time.

12. (original) The method according to claim 9, comprising determining an additional portion of the flow profile subsequent to the second elution time during which a rinse solvent is flowed through the column and into the API interface for washing the column.

13.-14. (canceled)

15. (amended) The method according to claim ~~14, wherein~~ 1, further comprising controlling the flow of the gas into the API interface according to the temperature profile ~~comprises~~ by controlling a heating device disposed in thermal communication with the gas.

16.-18. (canceled)

19. (currently amended) An apparatus for optimizing ~~a chromatographic~~ an LC/MS process for gradient elution, comprising:

(a) an API interface for ionizing a chromatographic eluent ~~of varying composition~~ flowing therein, the eluent comprising a first solvent having a first composition and a second solvent having a second composition different from the first composition, wherein the composition of the eluent varies over time;

(b) a gas conduit for flowing a gas into the API interface for interaction with the eluent; ~~and~~

(c) a heating control device for controlling a temperature of the gas flowing through the gas conduit according to a programmed temperature profile, wherein the temperature profile varies the gas temperature based on the varying composition of the eluent, and the temperature profile is programmed based on determining a first temperature of the gas for adding heat to the first solvent to evaporate the first solvent and a second temperature of the gas for adding heat to the second solvent to evaporate the second solvent;

(d) a flow control device for controlling the flow of the gas into the API interface; and

(e) an electronic processor-based device configured for controlling the heating control device and the flow control device in accordance with the temperature profile and a flow profile, respectively.

20.-21. (canceled)

22. (currently amended) The apparatus according to claim 20, ~~comprising~~ wherein the electronic processor-based device is configured to execute a computer program product including computer-executable instructions embodied in a computer-readable medium for controlling the heating control device and the flow control device in accordance with the temperature profile and flow profile, respectively.